

Safe Operation of Electric Aircraft in the Presence of Motor Failures

Completed Technology Project (2017 - 2018)



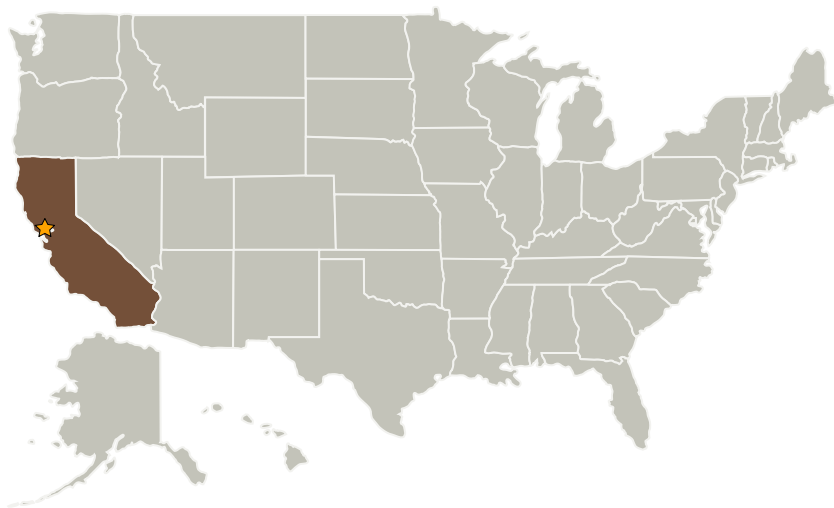
Project Introduction

The approach includes building a demonstration system consisting of an intelligent thrust management system that controls five small AC motors mechanically coupled to a single output shaft. The mechanical system connecting the motors and shaft will automatically disengage a failed motor from the propulsor shaft. An intelligent thrust management system will detect motor failures and compensate for the resulting power loss to maintain constant thrust (when the other motors have sufficient power).

Anticipated Benefits

Current aircraft propulsor designs have one engine or motor per propulsor. A failure of one engine or motor results in failure of one propulsor, and requires emergency landing. Many fatal accidents are attributed to engine failure. New configurations to increase urban mobility need high reliability for safety. To increase safety, we will develop an intelligent propulsor drivetrain enabling continued flight in the presence of motor failures. Specifically, we plan to design and build a propulsor drivetrain that adapts to motor failures to maintain constant thrust when sufficient power remains.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations
California

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Center Innovation Fund: ARC CIF

Project Management

Program Director:

Michael R Lapointe

Program Manager:

Harry Partridge

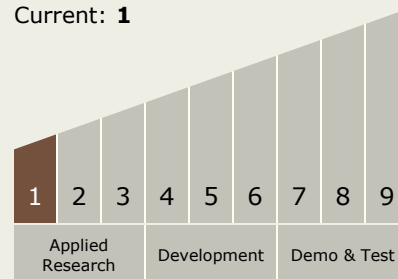
Principal Investigator:

Susan A Frost

Technology Maturity (TRL)

Start: 1

Current: 1



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Technology Areas

Primary:

- TX01 Propulsion Systems
 - └ TX01.3 Aero Propulsion
 - └ TX01.3.10 Turboelectric Propulsion

Target Destination

Earth